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Automated Disc Kiosks

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ELECTRICAL AND COMPUTER

Automated Disc Kiosks

CAPSTONE DESIGN EXPO 2015

Introduction

The consumer rental industry would benefit from the ability to rapidly deploy and redeploy available content to kiosks without having to send out a truck with an employee to manually exchange discs at every individual kiosk.

We believe our device will:

- Lower the cost of media distribution for rental purposes
- Reduce waste from discarded discs

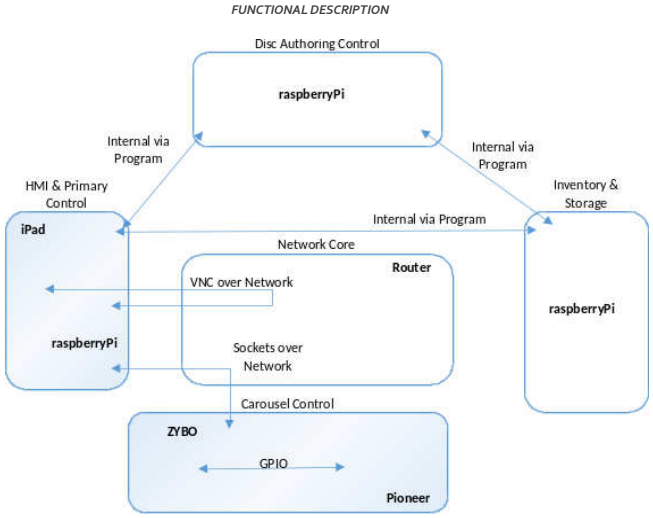
Overview/Project Goals

- Create simple user interface
- Store discs in carousel for easy access
- Burn stored image files to discs on demand in a timely manner
- Create image files from discs and store them
- Allow import of images via network

Functionality

- **Disc Storage:** The system will be able to store optical media to be easily accessible to users and other functionalities
- **Disc Inventory Management:** The system will need to know what discs are currently present in the carousel
- **Image Inventory Management:** An archive will be maintained by the program on the Raspberry Pi
- **Image to Disc Authoring:** The main Zybo program will load a blank disc; the Raspberry Pi will then issue a command to a disc authoring program to burn the specified image to the disc
- **Disc Vending:** The main Zybo program will align the carousel and dispense the disc to the customer
- **Disc Returns:** The user will select the return option from the main program, at which point the disc carousel will be aligned to an empty slot, or the request will be rejected if the carousel is full

Architecture



Future Additions

- Disc orientation verification/correction
- Vending discs in labeled sleeves/cases
- Web interface with remote management functions

Lessons Learned

- The Zybo board is more difficult to program for than expected
- Using a separate FPGA to execute the burning program actually makes the design more organized
- Controlling the carousel is not as simple as sending certain voltages to pins
- Making a error-free Android GUI with wireless communication has proven to be a challenge